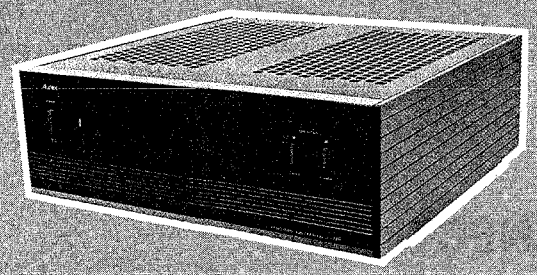
**SERVICE DATA**
**FILE NO. 170-156**

# TOSHIBA

## STEREO POWER AMPLIFIER

# SC-A99

LAMBDA



## SPECIFICATIONS

### ■ General

| | |
|---|---|
| **Power Sypply:** | 220V – 50 Hz for Europe or 240V – 50 Hz for the United Kingdom and Australia |
| **Power Consumption:** | 1100W |
| **Weight:** | 30 kg |
| **Dimensions:** | 450(W) x 172(H) x 473(D) mm |

### ■ Amplifier

| | | |
|---|---|---|
| **Continuous Power Output 20 Hz ∿ 20 kHz both ch. driven:** | | |
| | **Class A** | 80W x 2(4Ω), 50W x 2(8Ω) |
| | **Class AB** | 200W x 2(4Ω), 200W x 2(8Ω) |
| **Total Harmonic Distortion:** | | 0.004% (at rated power 8Ω) |
| **Frequency Response:** | | 5 Hz ∿ 200 kHz ($^{+0}_{-3}$ dB) |
| **Power Band Width (IHF):** | | 10 Hz ∿ 100 kHz (0.02%, 8Ω, –3 dB) |
| **Load Impedance:** | | 4Ω ∿ 16Ω |
| **Damping Factor:** | | 350 (1 kHz, 8Ω) |
| **S/N (IHF A Network):** | | 128 dB Class AB (at rated power 8Ω) |
| **Input Sensitivity/-Impedance: (at rated power 8Ω)** | Class A | 0.67V (50kΩ) |
| | Class AB | 1.34V (50kΩ) |

Specifications subject to change without notice.

TE,TU,AY

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## 1. SYSTEM CONNECTION

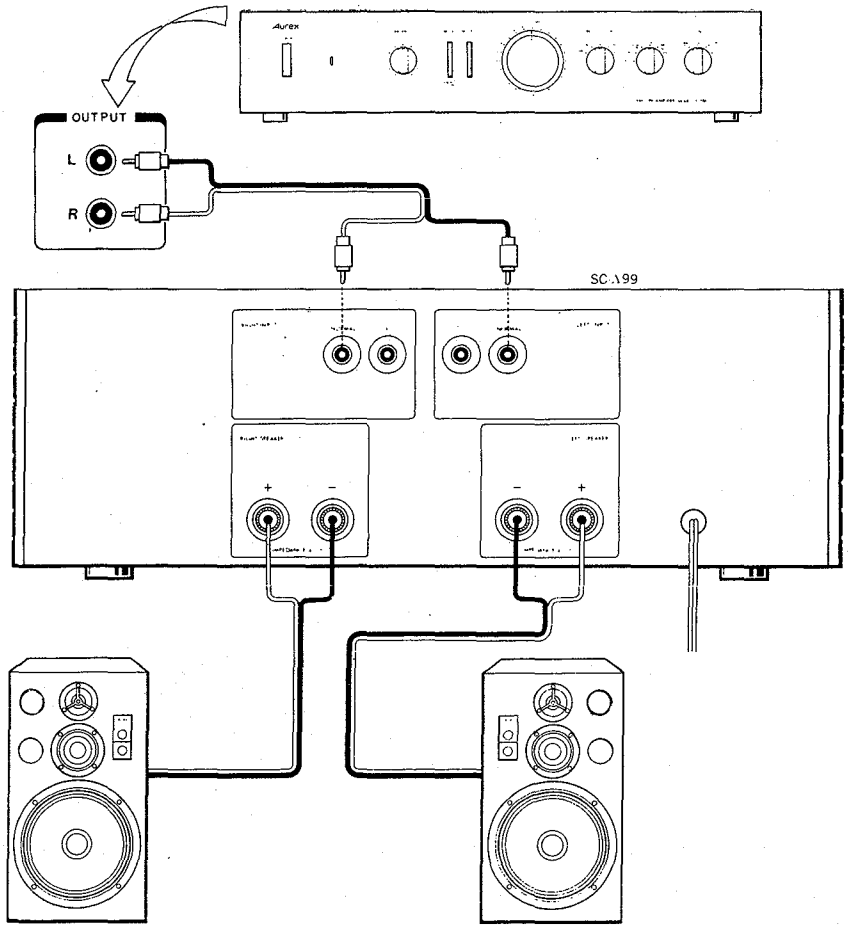



Figure 1

# 2. OPERATING CONTROLS

**❶ Power Switch**
Depress this switch to turn the power on, depress again to turn the power off. The LED lamp lights up when power is on.

**❸ Class A Operation Switch**
Depress this switch for Class A operation mode. Class A operation lamp ❹ lights up.

**❹ Class A Operation Lamp**

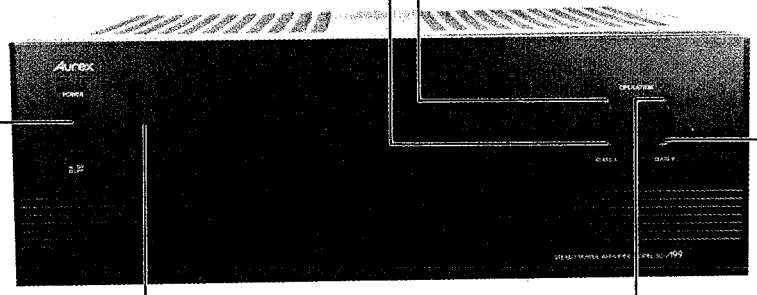


Figure 2

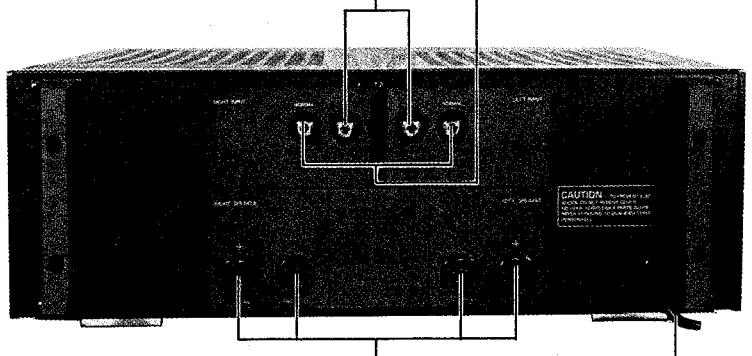
**❷ Power Indicator**
When the power is on, the lamp lights up red, and after 4 to 8 seconds, it changes to green. While the indicator is red, because the muting circuit is in operation, speakers will be silent.

**❺ Class AB Operation Switch**
Depress this switch for Class AB operation. Class AB operation lamp ❻ lights up.

**❻ Class AB Operation Lamp**

**❼ DC INPUT Terminals**
These are direct coupling terminals. The signal is directly input into this amplifier. (Take care of a preamplifier which may have DC leakage.)

**❾ NORMAL INPUT Terminals**
The signal is input through coupling capacitor. These terminals are for use with a preamplifier which may have DC leakage. The cut-off frequency is 3 Hz.



**❽ SPEAKER OUTPUT Terminals**
These terminals are for 4 to 16 ohms speakers. Connect the speaker cords securely not to be out of place.

Figure 3

**❿ Power cord**
Plug this power cord into the AC outlet (220/240V).
(As the plug terminal with a white line is minus, mind this when matching the power polarity of preamplifier or player.)

# 3. OPERATION

**Note:** Until all connections have been properly completed, leave the power supply cords unplugged and the power switches OFF.

■ **Connections of speaker to amplifier**

Connect right speaker cord to "R" amplifier speaker output terminal and left speaker cord to "L" terminal. Be sure to connect the plus terminal of speaker to the plus terminal of amplifier speaker output terminal and minus to minus. Wrong connection of plus and minus results in loss of playback sound quality in stereo mode.

- Be sure to leave amplifier power switch OFF while making connections.
- Don't short-circuit the amplifier speaker output terminals.

**Note:** Use speakers with an impedance of at least 4 ohms to avoid overloading the amplifier.

■ **Connection with a control amplifier (preamplifier)**

Connect the [INPUT] terminals of this amplifier with the [OUTPUT] terminals of a control amplifier (preamplifier) using PIN plug cord. When using the preamplifier section of an integrated amplifier, connect with [PRE OUT] terminals of the corresponding integrated amplifier. When connected with [DC] terminals, the signal is directly input into this amplifier. When connected with [NORMAL] terminals, the signal is input through coupling capacitor. This connection is for use with a preamplifier which may have DC leakage. The cut off frequency is 3 Hz.

■ **Protection of speakers and amplifier**

- This amplifier incorporates a power supply muting circuit to eliminate noise when power is on, and a protection circuit to prevent speaker damage caused by DC factor leakage into power.
- If protection circuit begins to operate while playing, thus cutting off sound from speakers, turn power OFF and make sure that speaker cords are not short-circuited.
- If problem continues, switch OFF, remove input PIN cord, switch ON. If power indicator ❷ goes green, the problem is in the preamplifier. If power indicator ❷ remains red, problem is in power amplifier. If the latter, consult your dealer. Never open cover or touch internal circuits or parts.
- When for some reason the internal temperature becomes dangerously high, a temperature protection circuit comes into operation, turning OFF the speaker protection relay and changing circuit operation to minimum power consumption; (power indicator ❷ turns red and operation lamps ❹ and ❻ go out.). Turn OFF and wait for amplifier to cool. Check that unit is in correct condition before turning ON again.

**Caution**

This power amplifier generates a large amount of heat. It should always be used in a well-ventilated area, and be surrounded by a 10 cm gap on all sides. Always check that heat radiation outlets are not obstructed. It is essential that amplifier be operated in a horizontal position. Never place amplifier in any other position -- vertical or slanting. Take precautions to avoid damage from high temperatures when using class A mode; temperature of upper panel may rise as high as 60°C depending on location of amplifier.

# 4. BLOCK DIAGRAM

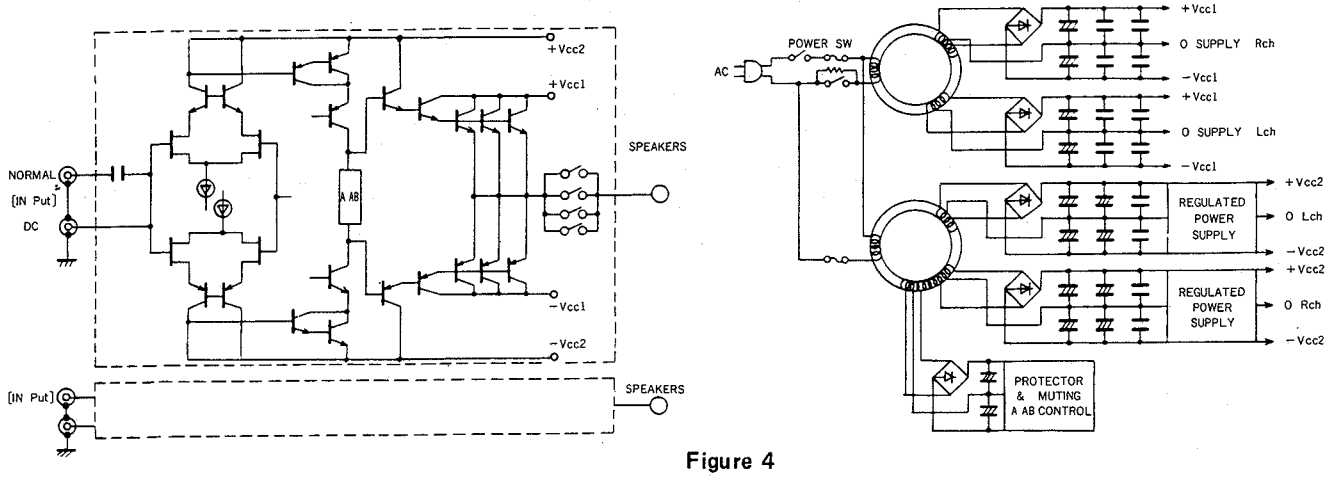



Figure 4

# 5. DISASSEMBLY INSTRUCTIONS

### BOTTOM PLATE REMOVAL

1. Remove nine screws Ⓐ (3ϕ x 8mm) and the bottom plate can be removed from the unit. See Figure 5.

### LEFT/RIGHT PANEL REMOVAL

1. Remove six screws Ⓑ and Ⓒ (3ϕ x 8mm) Left and Right side screws. See Figure 6.
2. Lift up the left and right panels to remove then as shown in Figure 7 and 8.

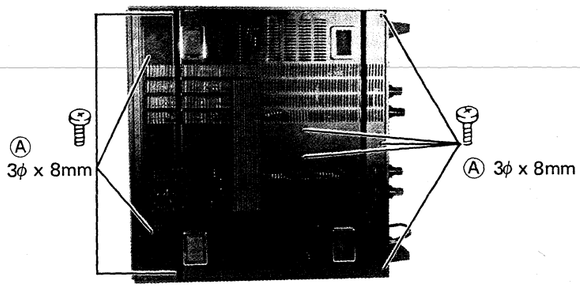



Figure 5

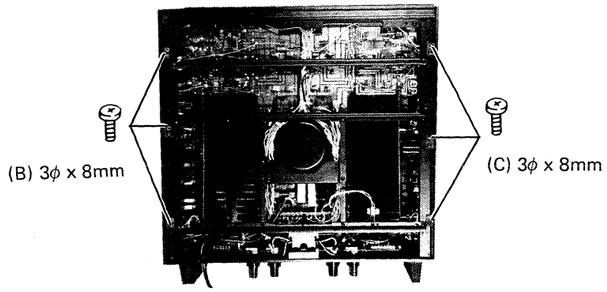



Figure 6

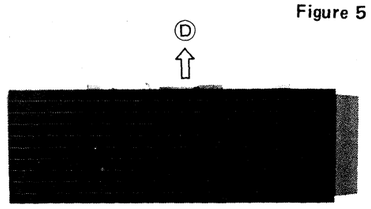



Figure 7

Figure 8

### TOP PLATE REMOVAL

1. Remove six screws Ⓕ and Ⓖ (3ϕ x 8mm) from each side. See Figure 9 and 10.

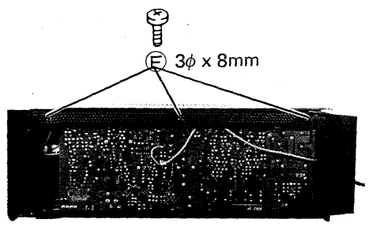



Figure 9

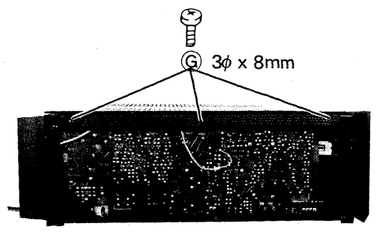



Figure 10

### FRONT PANEL REMOVAL

1. Remove three screws Ⓗ (3ϕ x 8mm) from the upper side and two screws Ⓘ (3ϕ x 8mm) from the bottom side. See Figure 11 and 12.

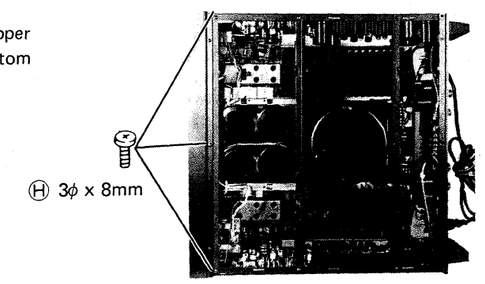



Figure 11



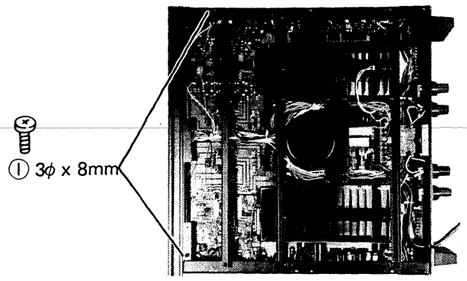



Figure 12

### JACK PLATE REMOVAL

1. Remove six screws Ⓙ (3ϕ x 8mm) from the bottom side. See Figure 13.
2. Remove four screws Ⓚ (3ϕ x 8mm) from the bottom side. See Figure 14.

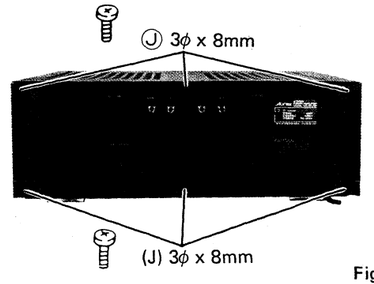



Figure 13

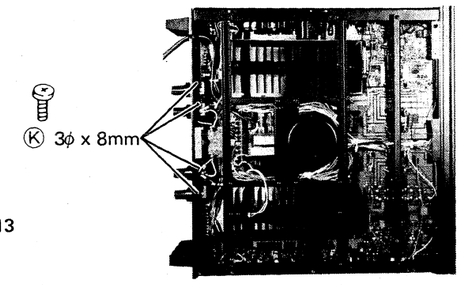



Figure 14

### INPUT/OUTPUT P.C. BOARD REMOVAL

1. Remove three screws Ⓛ (3ϕ x 8mm) to open the input/output P.C. Board. See Figure 15.

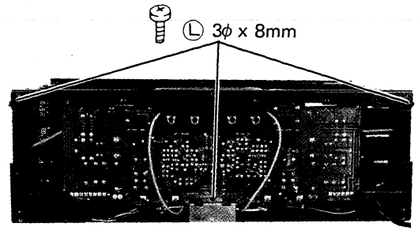



Figure 15

### LEFT/RIGHT DRIVE P.C. BOARDS REMOVAL

1. Remove eight screws Ⓜ, Ⓟ and Ⓢ (3ϕ x 8mm). See Figure 16, 17 and 18.
2. Remove ten screws Ⓞ, Ⓝ, Ⓠ and Ⓡ (3ϕ x 8mm) to open the left/right drive P.C. Boards. (See Figures 17 and 18.)

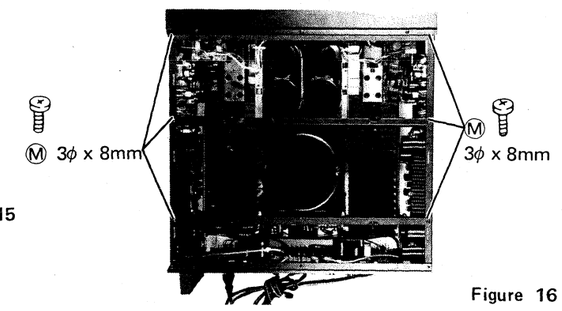



Figure 16

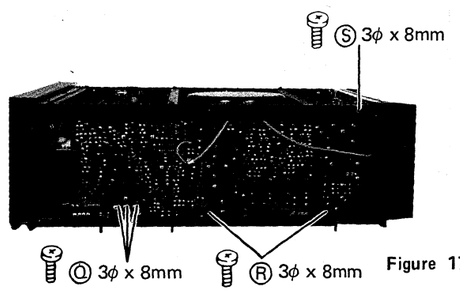



Figure 17

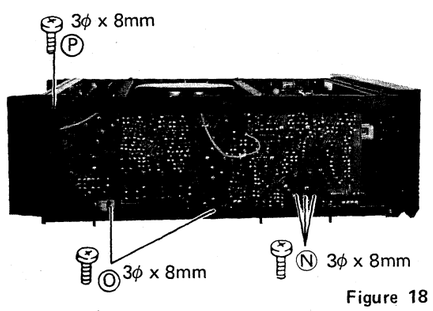
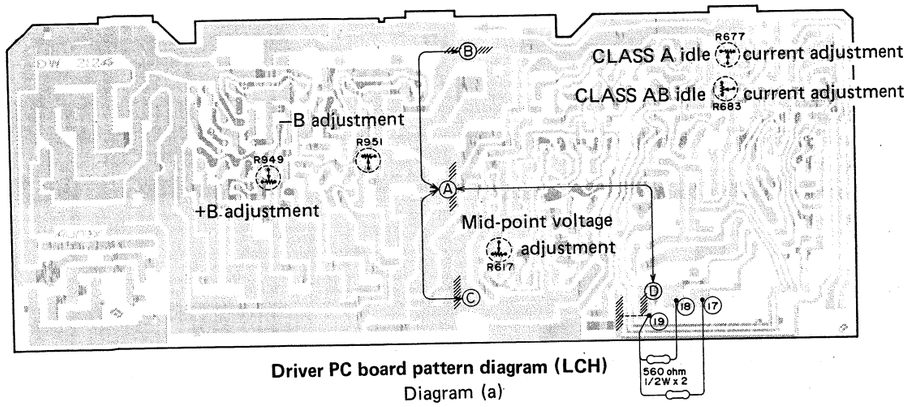
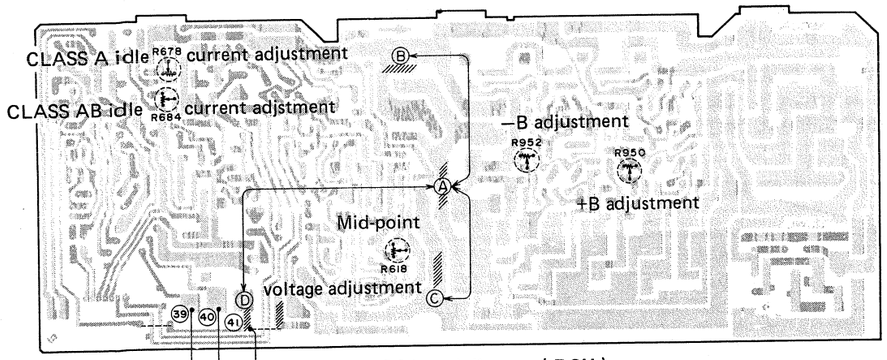



Figure 18

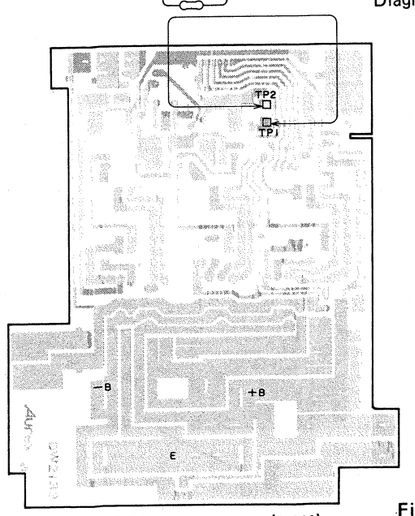
# 6. ADJUSTMENTS



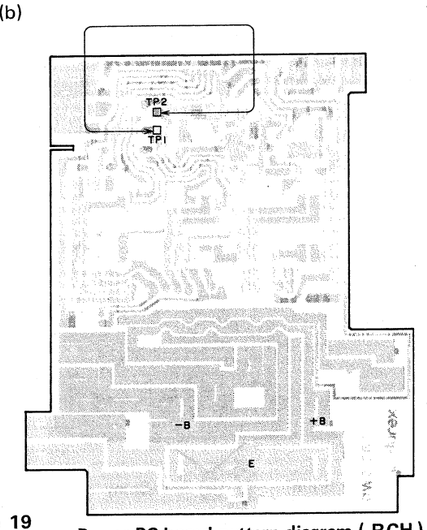

**Driver PC board pattern diagram (LCH)**
Diagram (a)




**Drive PC board diagram ( RCH )**
Diagram (b)




**Power PC board diagram (LCH)**
Figure (c)




**Power PC board pattern diagram ( RCH )**
Figure (d)

Figure 19



## Adjustment Procedures

### 1) Regulated Power Supply Voltage Adjustment

**1-1) +B Adjustment**
Adjust semi-fixed VRs, R949 and R950 so that the voltage level between Ⓐ and Ⓑ shown in the attached pattern diagrams (a) . . . Lch, and (b) . . . Rch is + 75V. (Turning clockwise will increase voltage.)

**1-2) –B Adjustment**
Adjust semi-fixed VRs R951 and R952 so that the voltage level between Ⓐ and Ⓒ shown in the attached pattern diagrams (a) . . . Lch, and (b) . . . Rch is –75V. (Turning clockwise will increase voltage.)

### 2) Mid-point Voltage Adjustment

Adjust semi-fixed VRs R617 and R618 so that the voltage level between the chassis (or Ⓐ) and Ⓓ in the attached pattern diagrams (a) and (b) reaches –10 mV when the unit is cooled down (*1).

(*1) The voltage level to be adjusted when the unit is cooled down is different from that when the unit is of thermal stability because the mid-point voltage level slightly drifts. Therefore, adjust VRs R617 and R618 so that the absolute mid-point voltage level when the unit is turned on is almost the same with that when the unit is thermally stabilized.

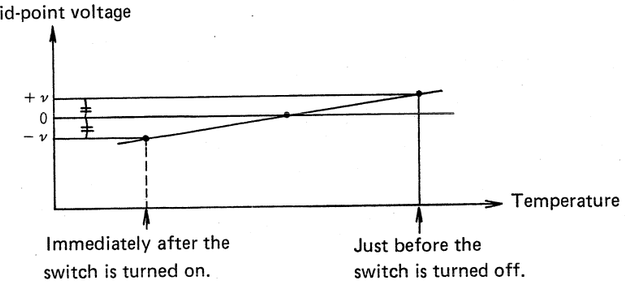



**Figure 20**

The mid-point voltage can also be measured at SP terminals, provided that the muting relay is on.

### 3) Idle Current Adjustment (*2)

**3-1) CLASS A Idle Current Adjustment**
Set the OPERATION switch on the front panel to A and adjust semi-fixed VRs R677 and R678 so that the voltage level between TP1 and TP2 shown in the power PC board pattern diagrams (c) . . . Lch and Rch is 260 mV. (Turning clockwise will increase will increase idle current.)

**3-2) CLASS AB Idle Current Adjustment**
Set the OPERATION switch on the front panel to AB and adjust semi-fixed VRs R683 and R684 so that the voltage level between TP1 and TP2 shown in the pattern diagrams is 33 mV. (Turning clockwise will increase idle current.)

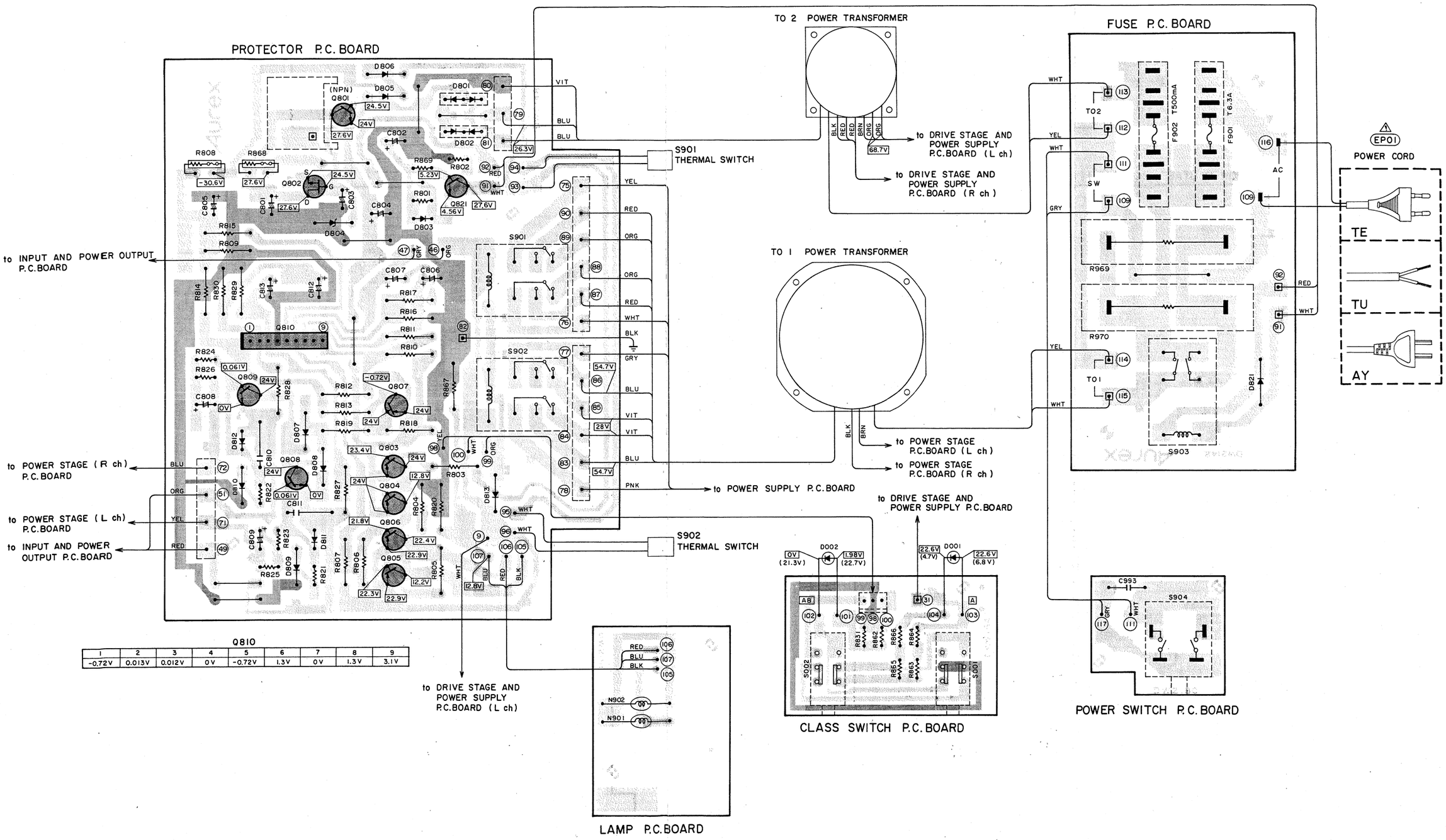
(*2) Make sure to adjust CLASS A idle current before adjusting CLASS AB idle current. The reverse is not possible.

### 4) REPAIRS

**4-1) When the power TR is replaced due to breakage:**
(1) Check resistors R733, R734, R743 through R754, and R729 through R732 for damage.
(2) If normal, remove brass screws ⑰, ⑱, and ⑲ in Diagram (a) and ㊴, ㊵, and ㊶ in Diagram (b).
(3) Connect a resistor of 560 Ω (1/2) to between ⑲ and ⑰ and also to between ⑲ and ⑱ in Diagram (a). Connect a resistor of 560 Ω (1/2) to between ㊶ and ㊴ and also to between ㊶ and ㊵ in Diagram (b).
(4) Connect a synchroscope to between Ⓐ and Ⓓ in Diagrams (a) and (b) in order to verify the driver PC board performance.
(5) Connect an oscillator (f = 100 Hz to 1 kHz) to the INPUT terminal.
(6) Set the POWER switch to ON and confirm that the wave form of the synchroscope is clipped symmetrically against the horizontal axis both in Lch and Rch.
(7) If Step (6) is OK, set the POWER switch to OFF and discharge the power chemical condenser.
(8) Fix the brass screws ⑰, ⑱, ⑲, ㊴, ㊵, and ㊶, removed in Step (2) and remove the resistors of 560 Ω (1/2).
(9) After Steps (1) through (8), verify Steps 1), 2), and 3).

**4-2) When the Power TR is normal but the unit is inoperative:**
(1) Remove the brass screws as in Step (2) of Sub-section 4-1), and perform Step (3).
(2) With the brass screws removed and the resistors of 560 Ω connected, check the unit for damage. . . . Operation by the driver PC board only.

# 7-1. P.C. BOARD PARTS LOCATIONS PROTECTOR, FUSE, POWER SWITCH, CLASS SWITCH and LAMP P. C . BOARD


PROTECTOR P.C. BOARD
FUSE P.C. BOARD
TO 2 POWER TRANSFORMER
TO 1 POWER TRANSFORMER
to INPUT AND POWER OUTPUT P.C.BOARD
to POWER STAGE ( R ch ) P.C.BOARD
to POWER STAGE ( L ch ) P.C.BOARD
to INPUT AND POWER OUTPUT P.C.BOARD
to DRIVE STAGE AND POWER SUPPLY P.C.BOARD ( L ch )
to DRIVE STAGE AND POWER SUPPLY P.C.BOARD ( R ch )
to POWER STAGE P.C.BOARD ( L ch )
to POWER STAGE P.C.BOARD ( R ch )
to POWER SUPPLY P.C.BOARD
to DRIVE STAGE AND POWER SUPPLY P.C.BOARD
to DRIVE STAGE AND POWER SUPPLY P.C.BOARD ( L ch )
S901 THERMAL SWITCH
S902 THERMAL SWITCH
POWER CORD
TE
TU
AY
CLASS SWITCH P.C. BOARD
POWER SWITCH P.C. BOARD
LAMP P.C.BOARD
F902 T500mA
F901 T6.3A
S901
S902
S903
S904
Q810

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| -0.72V | 0.013V | 0.012V | 0V | -0.72V | 1.3V | 0V | 1.3V | 3.1V |

Figure 21



**CAUTION:**
The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replace only with types identical to those in the original circuit or specified in the parts list.

# 7 -2. P.C. BOARD PARTS LOCATIONS POWER STAGE P.C. BOARD

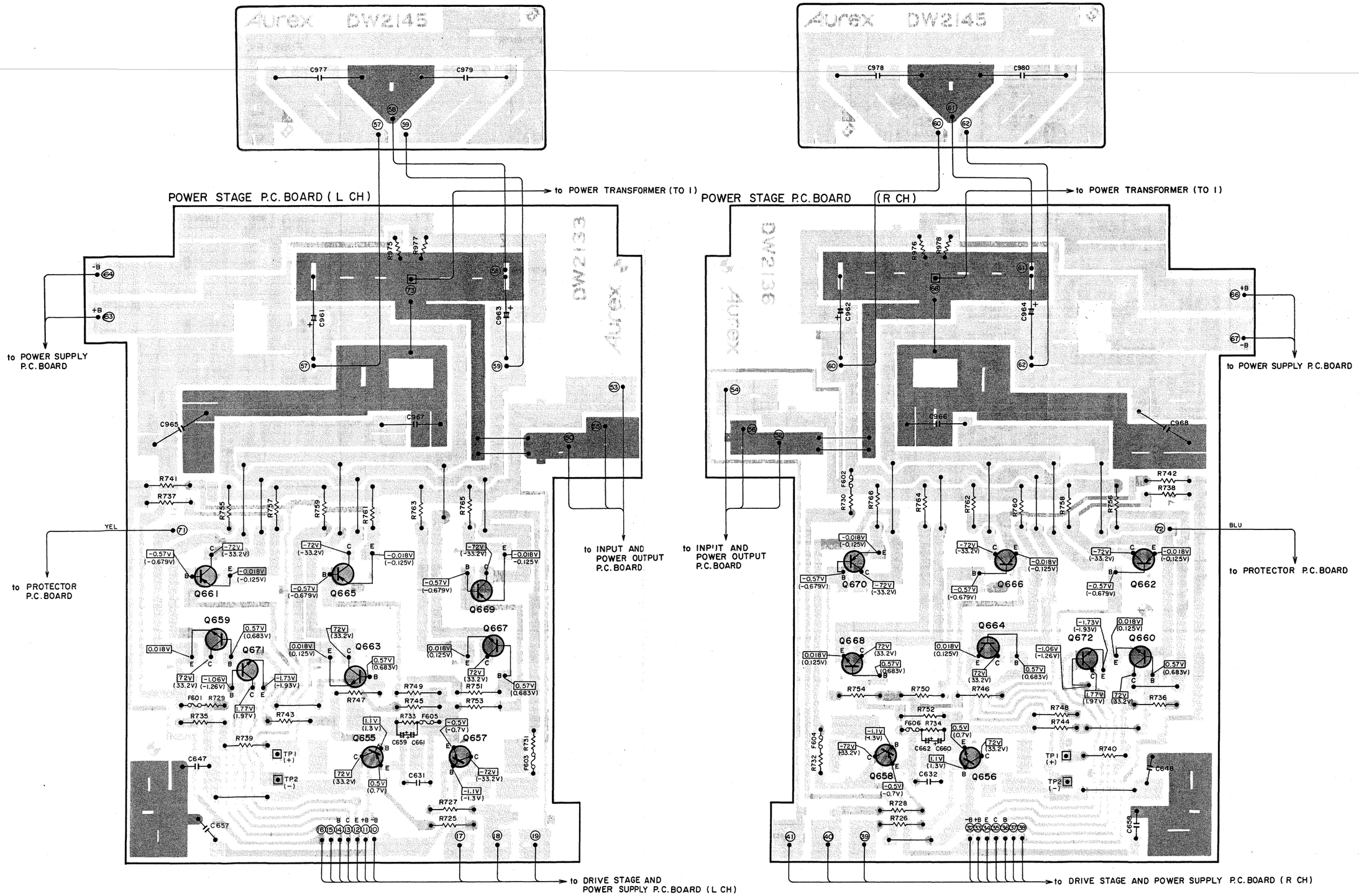



Figure 22



**CAUTION:**
The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replace only with types identical to those in the original circuit or specified in the parts list.

# 7-3. P.C. BOARD PARTS LOCATIONS POWER SUPPLY and INPUT and POWER OUTPUT P.C. BOARD

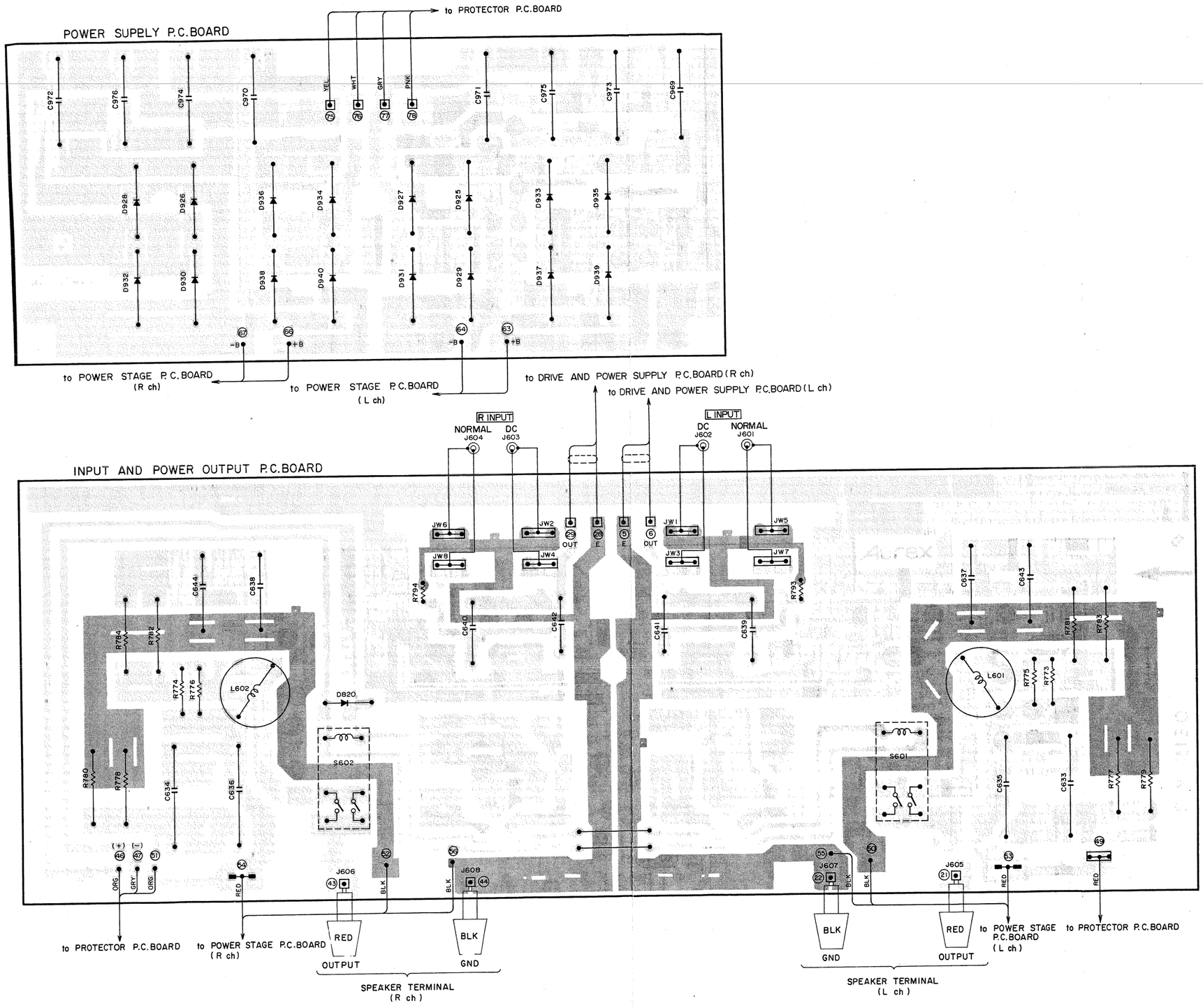



Figure 23



**CAUTION:**
The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replace only with types identical to those in the original circuit or specified in the parts list.

# 7. -4. P.C. BOARD PARTS LOCATIONS DRIVE STAGE STAGE and POWER SUPPLY P.C. BOARD (L) and (R)

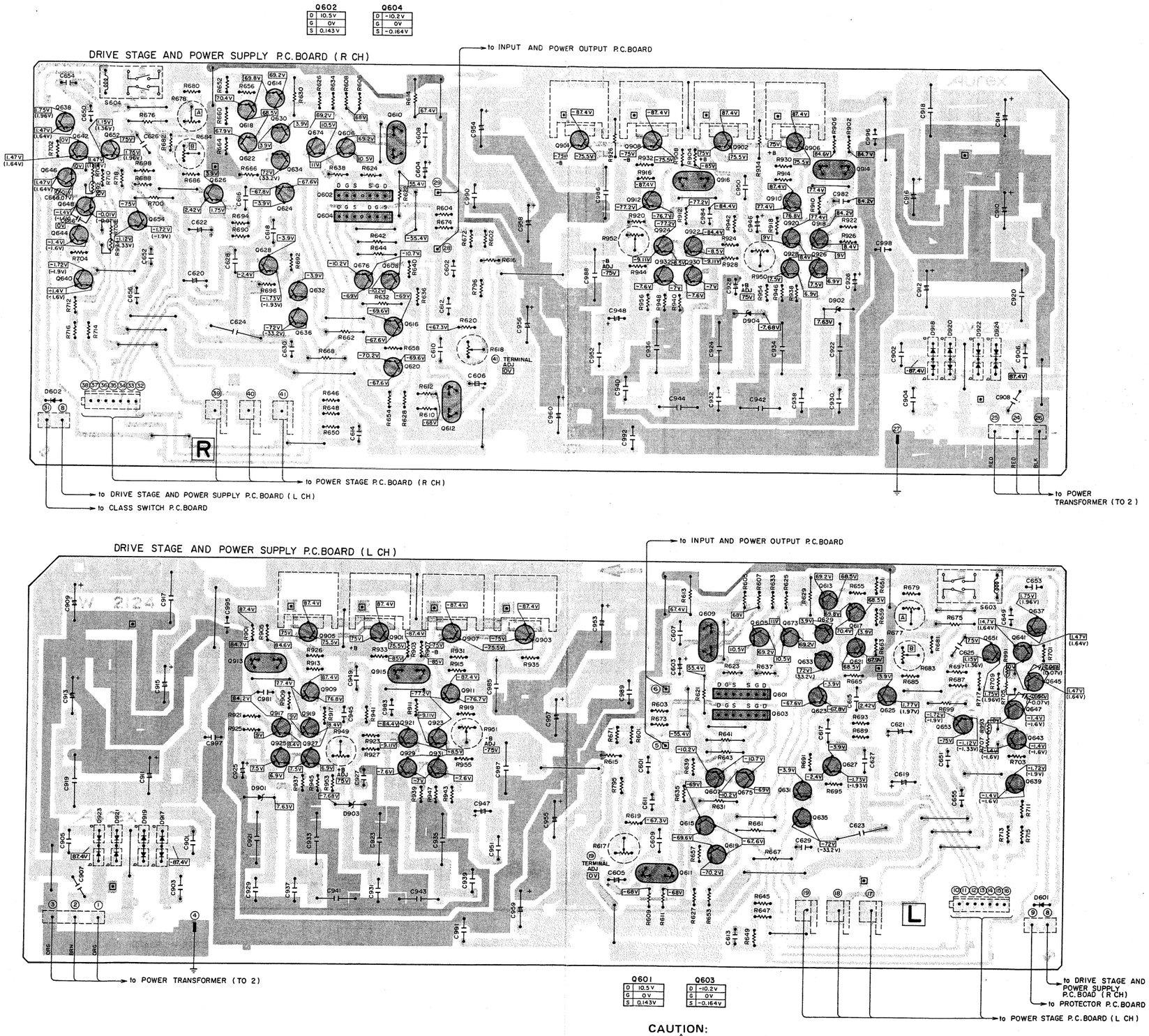
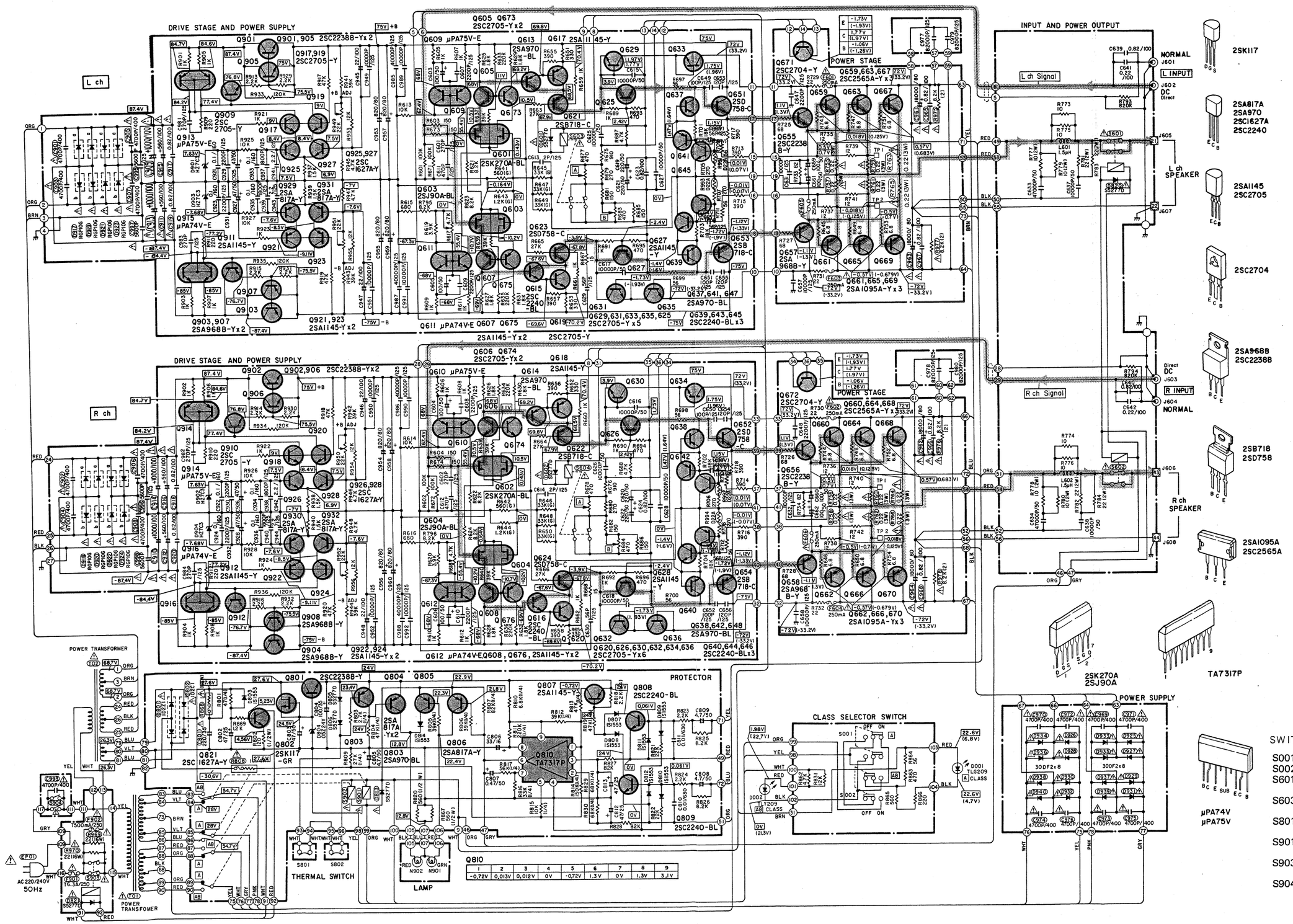

Q602
D 10.5V
G 0V
S 0.143V
Q604
D -10.2V
G 0V
S -0.164V
DRIVE STAGE AND POWER SUPPLY P.C.BOARD ( R CH )
to INPUT AND POWER OUTPUT P.C.BOARD
to POWER STAGE P.C.BOARD ( R CH )
to DRIVE STAGE AND POWER SUPPLY P.C.BOARD ( L CH )
to CLASS SWITCH P.C.BOARD
to POWER TRANSFORMER ( TO 2 )
DRIVE STAGE AND POWER SUPPLY P.C.BOARD ( L CH )
to INPUT AND POWER OUTPUT P.C.BOARD
Q601
D 10.5V
G 0V
S 0.143V
Q603
D -10.2V
G 0V
S -0.164V
to POWER TRANSFORMER ( TO 2 )
to DRIVE STAGE AND POWER SUPPLY P.C.BOAD ( R CH )
to PROTECTOR P.C.BOARD
to POWER STAGE P.C.BOARD ( L CH )

**Figure 24**

**CAUTION:**
The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replace only with types identical to those in the original circuit or specified in the parts list.

# 8. SCHEMATIC DIAGRAM




| Q810 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| -0.72V | 0.013V | 0.012V | 0V | -0.72V | 1.3V | 0V | 1.3V | 3.1V |

| SWITCHES | | POSITIONS |
|---|---|---|
| S001 | : A-Class Sw. | ON |
| S002 | : A/B Class Sw. | OFF |
| S601, 602 | : Relay Sw. (Protection) | ON |
| S603, 604 | : Relay Sw. (A/B-Class) | A-Class |
| S801, 802 | : Temperature Detect Sw. | ON |
| S901, 902 | : Relay Sw. (A/B-Class) | A-Class |
| S903 | : Relay Sw. (Rush Protection) | ON |
| S904 | : Power Sw. | ON |

▭ VOLTAGE IN A-CLASS AT NO SIGNAL.
( ) VOLTAGES IN A/B-CLASS AT NO SIGNAL.

**Figure 25**



**CAUTION:**
The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replace only with types identical to those in the original circuit or specified in the parts list.

# 9. -1. EXPLODED VIEW CABINET

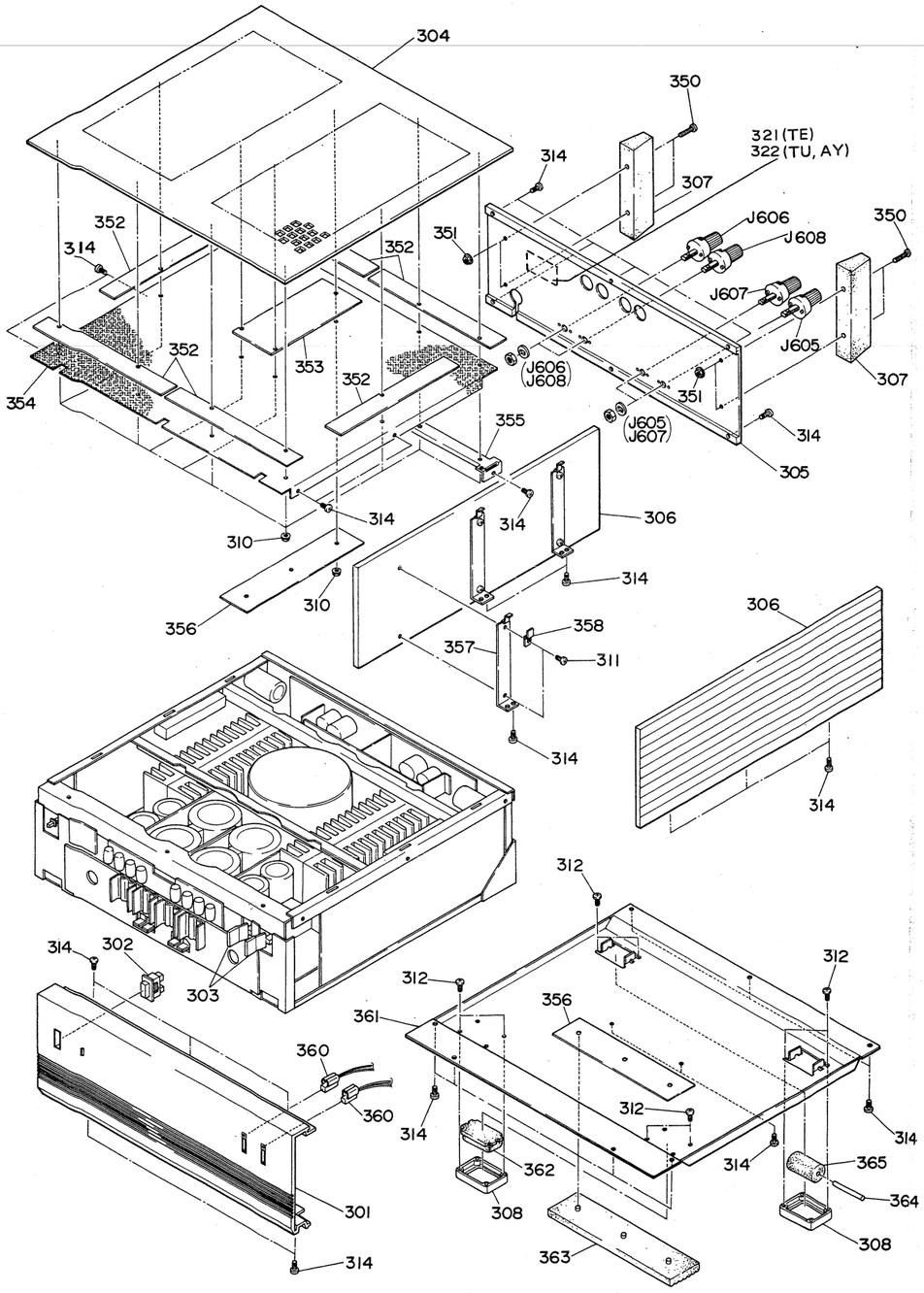



**Figure 26 NOTE:** Parts excluded in the parts list are not available as replacement parts.



# 9-2. EXPLODED VIEW CABINET

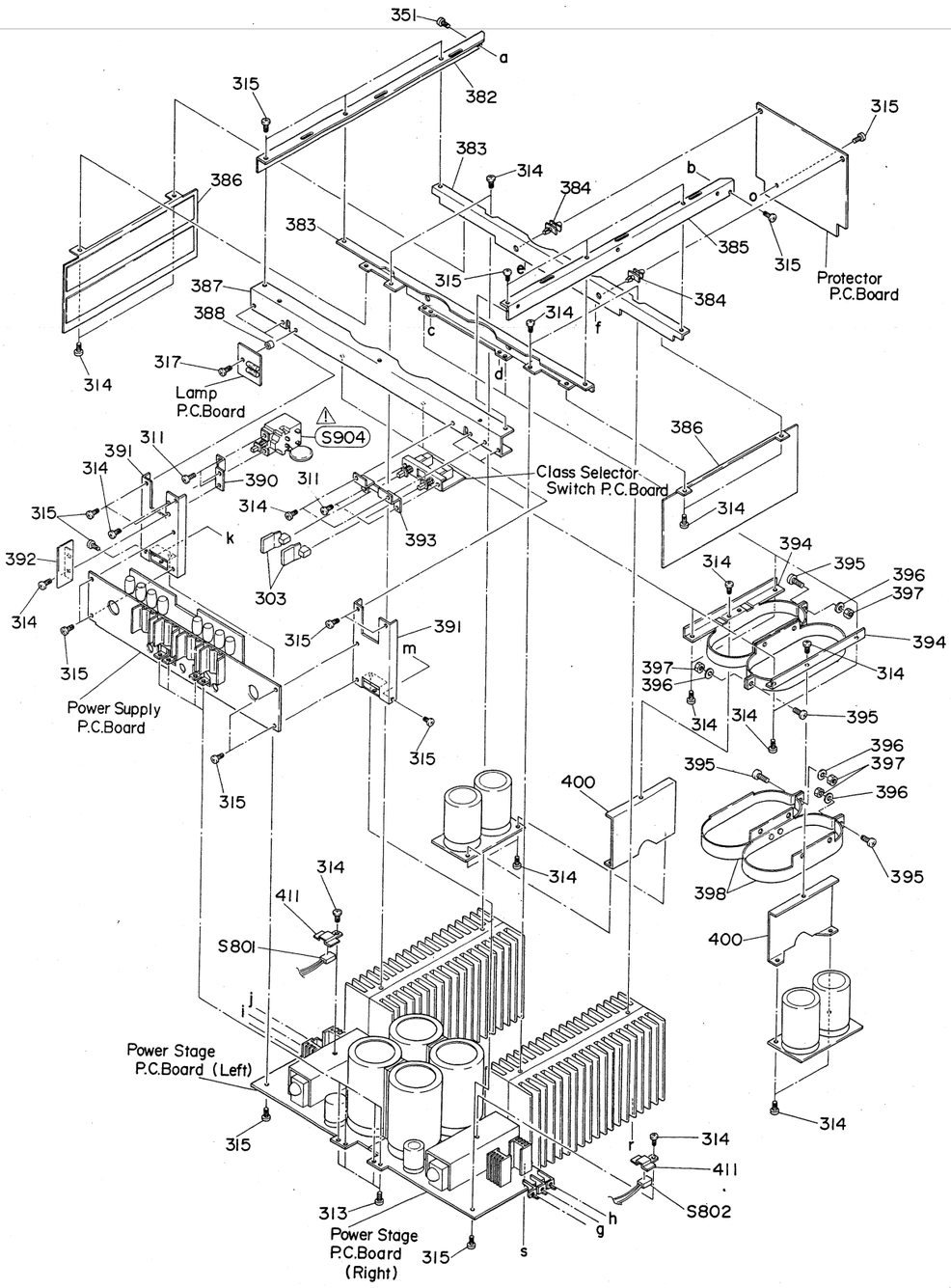



**Figure 27**

**NOTE:** Parts excluded in the parts list are not available replacement parts.

# 9-3. EXPLODED VIEW CABINET

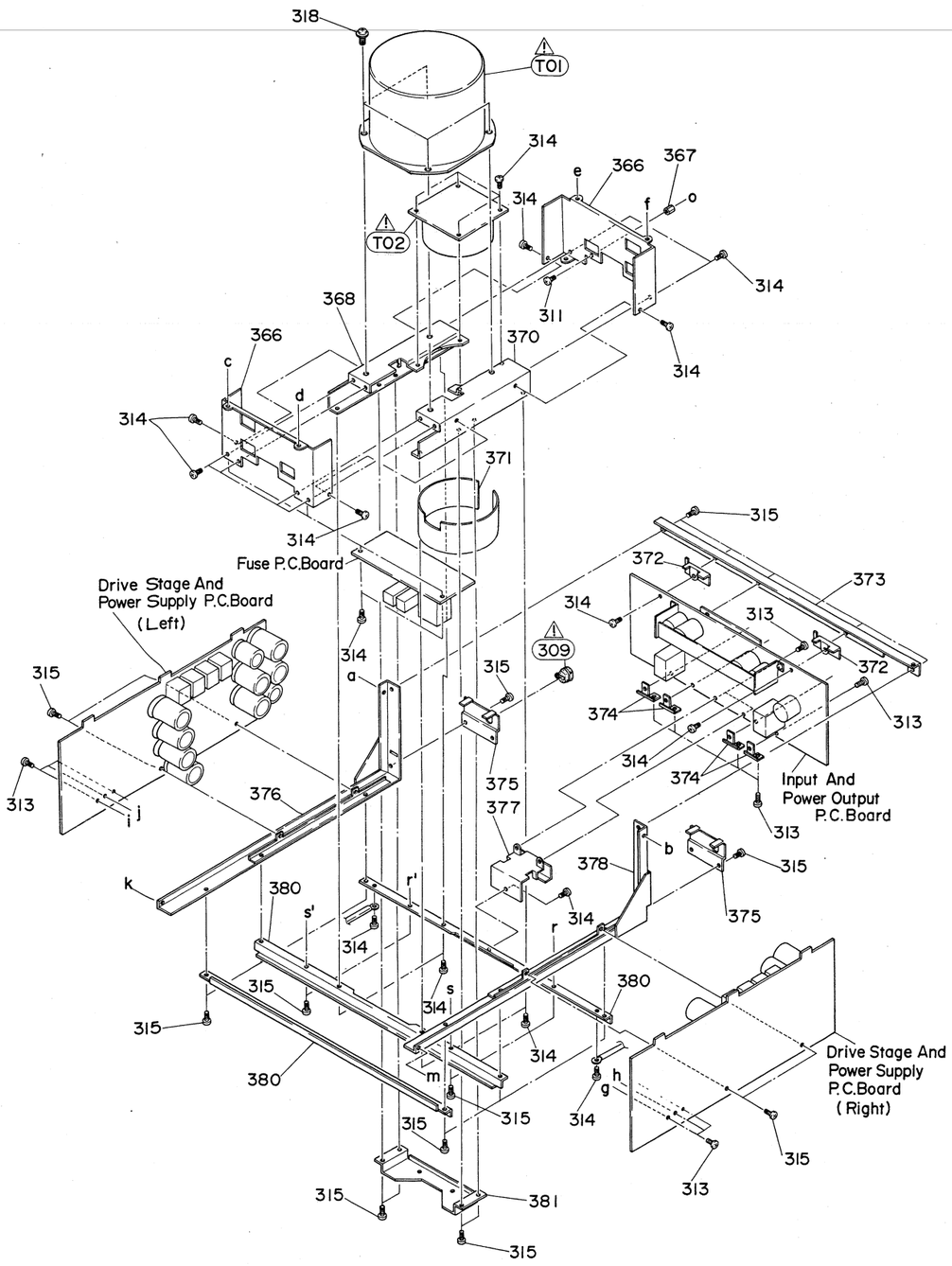



Figure 28 **NOTE:** Parts excluded in the parts list are not available as replacement parts.



# 9-4. PARTS LIST (CABINET)

**CAUTION:**
The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replace only with types identical to those in the original circuit or specified in the parts list.

| Symbol No. | Part No. | Description |
|---|---|---|
| 301 | 22825059 | Front Panel Ass'y |
| 302 | 22824380 | Knob Ass'y, Power |
| 303 | 22884023 | Knob, A/B Selector |
| 304 | 22844368 | Top Panel |
| 305 | 22844369 | Back Panel |
| 306 | 22844370 | Side Panel |
| 307 | 22874073 | Protector |
| 308 | 22833382 | Foot Holder |
| ⚠ 309 | 25845528 | Cord Bush |
| 310 | 20796041 | Nut, 3$\phi$ |
| 311 | 22701313 | Screw, 3$\phi$ x 4mm, BID |
| 312 | 22701237 | Screw, 3$\phi$ x 6mm, BID Tapping |
| 313 | 22707393 | Screw, 3$\phi$ x 8mm, BID |

| Symbol No. | Part No. | Description |
|---|---|---|
| 314 | 22701326 | Screw, 3$\phi$ x 8mm, BID Tapping |
| 315 | 22707543 | Screw, 3$\phi$ x 8mm, BID Tapping |
| 317 | 22707118 | Screw, 3$\phi$ x 12mm, BID Tapping |
| 318 | 22707196 | Screw, 4$\phi$ x 8mm, FLFTPAN |
| 321 | 22864476 | Nameplate (TE) |
| 322 | 22864477 | Nameplate (TU, AY) |
| 361 | 22714133 | Bottom Plate |
| 362 | 22874048 | Foot |
| 364 | 22743243 | Shaft, Carting Wheel |
| 365 | 22874050 | Carting Wheel |

# 10. PARTS LIST

| Symbol No. | Part No. | Description |
|---|---|---|
| **TRANSISTORS, IC'S & DIODES** | | |
| ABBREVIATIONS: TR = Transistor | | |
| Q601, 602 | A6046030 | TR, 2SK270A-BL |
| Q603, 604 | A6040870 | TR, 2SJ90A-BL |
| Q605, 606 | A6334820 | TR, 2SC2705-Y-O/Y |
| Q607, 608 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q609, 610 | 22114921 | TR, $\mu$PA75V-E-F/E |
| Q611, 612 | 22114920 | TR, $\mu$PA74V-E-F/E |
| Q613, 614 | A6533645 | TR, 2SA970NEW-BL |
| Q615, 616 | A6325845 | TR, 2SC2240NEW-BL |
| Q617, 618 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q619, 620 | A6334820 | TR, 2SC2705-Y-O/Y |
| Q621, 622 | 22114707 | TR, 2SB718-C |
| Q623, 624 | 22114708 | TR, 2SD758-C |
| Q625, 626 | A6334820 | TR, 2SC2705-Y-O/Y |
| Q627, 628 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q629, 630 | A6334820 | TR, 2SC2705-Y-O/Y |
| 631, 632 | | |
| 633, 634 | | |
| 635, 636 | | |
| Q637, 638 | A6533645 | TR, 2SA970NEW-BL |
| Q639, 640 | A6325845 | TR, 2SC2240NEW-BL |
| Q641, 642 | A6533645 | TR, 2SA970NEW-BL |
| Q643, 644 | A6325845 | TR, 2SC2240NEW-BL |
| 645, 646 | | |

| Symbol No. | Part No. | Description |
|---|---|---|
| Q647, 648 | A6533645 | TR, 2SA970NEW-BL |
| Q651, 652 | 22114708 | TR, 2SD758-C |
| Q653, 654 | 22114707 | TR, 2SB718-C |
| Q655, 656 | A6325680 | TR, 2SC2238B-Y |
| Q657, 658 | A6533480 | TR, 2SA968B-Y |
| Q659, 660 | A6332335 | TR, 2SC2565A-Y-Y/O |
| Q661, 662 | A6535535 | TR, 2SA1095A-Y-Y/O |
| Q663, 664 | A6332335 | TR, 2SC2565A-Y-Y/O |
| Q665, 666 | A6535535 | TR, 2SA1095A-Y-Y/O |
| Q667, 668 | A6332335 | TR, 2SC2565A-Y-Y/O |
| Q669, 670 | A6535535 | TR, 2SA1095A-Y-Y/O |
| Q671, 672 | A6333690 | TR, 2SC2704-Y |
| Q673, 674 | A6334820 | TR, 2SC2705-Y-O/Y |
| Q675, 676 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q801 | A6325680 | TR, 2SC2238B-Y |
| Q802 | A6041860 | TR, 2SK117-GR |
| Q803 | A6533645 | TR, 2SA970NEW-BL |
| Q804, 805 | A6531170 | TR, 2SA817A-Y |
| Q806 | A6531170 | TR, 2SA817A-Y |
| Q807 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q808 | A6325845 | TR, 2SC2240NEW-BL |
| Q809 | A6325845 | TR, 2SC2240NEW-BL |
| Q810 | B0324800 | IC, TA7317P |
| Q821 | A6314470 | TR, 2SC1627A-Y |

| Symbol No. | Part No. | Description |
|---|---|---|
| Q901, 902 | A6325680 | TR, 2SC2238B-Y |
| Q903, 904 | A6533480 | TR, 2SA968B-Y |
| Q905, 906 | A6325680 | TR, 2SC2238B-Y |
| Q907, 908 | A6533480 | TR, 2SA968B-Y |
| Q909, 910 | A6334820 | TR, 2SC2705-Y-O/Y |
| Q911, 912 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q913, 914 | 22114921 | TR, μPA75V-E-F/E |
| Q915, 916 | 22114920 | TR, μPA74V-E-F/E |
| Q917, 918 919, 920 | A6334820 | TR, 2SC2705-Y-O/Y |
| Q921, 922 923, 924 | A6540520 | TR, 2SA1145-Y-O/Y |
| Q925, 926 927, 928 | A6314470 | TR, 2SC1627A-Y |
| Q929, 930 931, 932 | A6531170 | TR, 2SA817A-Y |
| D001 | A8606680 | Diode, TLG209, GRN |
| D002 | A8608860 | Diode, TLY209, YEL |
| ⚠ D601, 602 | A7978385 | Diode, S5277D |
| ⚠ D801 | A7682061 | Diode, 1D2Z1 (T) |
| ⚠ D802 | A7682021 | Diode, 1D2C1 (T) |
| D803 | A7246601 | Diode, 1S1553V |
| D804 | A7110664 | Diode, 05Z24-Y |
| D805, 806 | A7978385 | Diode, S5277D |
| D807, 808 809, 810 811, 812 | A7246601 | Diode, 1S1553V |
| ⚠ D813 | A7978385 | Diode, S5277D |
| D814 | A7246601 | Diode, 1S1553V |
| ⚠ D820, 821 | A7978385 | Diode, S5277D |
| D901, 902 903, 904 | 22115756 | Diode, HZ7L-C-3 |
| ⚠ D917a-b | 22115774 | Diode, RGP10G |
| 918a-b | 22115774 | Diode, RGP10G |
| 919a-b | 22115774 | Diode, RGP10G |
| 920a-b | 22115774 | Diode, RGP10G |
| 921a-b | 22115774 | Diode, RGP10G |
| 922a-b | 22115774 | Diode, RGP10G |
| 923a-b | 22115774 | Diode, RGP10G |
| 924a-b | 22115774 | Diode, RGP10G |
| ⚠ D925, 926 | 22115681 | Diode, 30DF |
| 927, 928 | | |
| 929, 930 | | |
| 931, 932 | | |
| 933, 934 | | |
| 935, 936 | | |
| 937, 938 | | |
| 939, 940 | | |

| Symbol No. | Part No. | Description |
|---|---|---|
| **ELECTRICAL PARTS** | | |
| L610, 602 | 22210165 | Coil, 1.5mH |
| ⚠ T01 | 22224121 | Transformer, Power Large (TE) |
| ⚠ T01 | 22224123 | Transformer, Power Large (TU, AY) |
| ⚠ T02 | 22224122 | Transformer, Power Small (TE) |
| ⚠ T02 | 22224124 | Transformer, Power Small (TU, AY) |
| S001, 002 | 22195963 | Switch, Push, A/B Class Selector |
| ⚠ S601, 602 | 22148667 | Switch, Relay, Output, DC 24V |
| S603, 604 | 22148676 | Switch, Relay, A/B Class Selector |
| S801, 802 | 22195961 | Switch, Thermal |
| ⚠ S901, 902 | 22148125 | Switch, Relay, A/B Class Selector |
| ⚠ S903 | 22148667 | Switch, Relay, Rush Prevention |
| ⚠ S904 | 22146295 | Switch, Push, Power |
| J601, 602 J603, 604 | 22163732 | Jack, US1P, Input |
| J605, 606 | 22162440 | Terminal, Speaker, 1P, RED |
| J607, 608 | 22162439 | Terminal, Speaker, 1P, BLK |
| N901 | 22113531 | Lamp, 14V, 50mA, GRN |
| N902 | 22113548 | Lamp, 14V, 50mA, RED |
| F601, 602 603, 604 605, 606 | 22144453 | Fuse, 250mA, 125V |
| ⚠ F901 | 22144291 | Fuse, T6.3A, 250V |
| ⚠ F902 | 22144408 | Fuse, T500mA, 250V |
| ⚠ EP01 | 22176571 | Cord, Power (TE) |
| ⚠ EP01 | 22176628 | Cord, Power (TU) |
| ⚠ EP01 | 22176588 | Cord, Power (AY) |

**CAPACITORS**

K = ±10% M = ±20%

ABBREVIATIONS: CS = Copper Leaf Stylene, EL = Electrolytic, MPF = Metalized Polyester Film

| | | |
|---|---|---|
| C601, 602 | 22380243 | CS, 270pF, 125V, K |
| C603, 604 605, 606 | 22440376 | EL, 100mfd, 50V |
| C607, 608 609, 610 | 22380247 | CS, 2200pF, 125V, K |
| C611, 612 | 22380244 | CS, 470pF, 125V, K |
| C613, 614 | 22380239 | CS, 2pF, 125V, K |
| C615, 616 617, 618 | 22380238 | CS, 10000pF, 50V, K |
| C619, 620 621, 622 | 22440460 | EL, 220mfd, 50V |
| C623, 624 | 22370306 | MPF, 0.82mfd, 100V, K |
| C625, 626 | 22380238 | CS, 10000pF, 50V, K |



| Symbol No. | Part No. | Description |
|---|---|---|
| C627, 628 | 22380238 | CS, 10000pF, 50V, K |
| C629, 630 | 22380252 | CS, 56pF, 125V, K |
| C631, 632 | 22380229 | CS, 10000pF, 125V, K |
| C633, 634 | 22380235 | CS, 47000pF, 50V, K |
| C637, 638 | 22380236 | CS, 10000pF, 50V, K |
| C639, 640 | 22370306 | MPF, 0.82mfd, 100V, K |
| C641, 642 | 22370307 | MPF, 0.22mfd, 100V, K |
| C647,648 | 22380247 | CS, 2200pF, 125V, K |
| C649, 650 651, 652 | 22380241 | CS, 100pF, 125V, K |
| C653, 654 655, 656 | 22380242 | CS, 120pF, 125V, K |
| C657, 658 | 22380229 | CS, 10000pF, 125V, K |
| C659, 660 661, 662 | 22440376 | EL, 100mfd, 50V |
| C663, 664 665, 666 | 22380252 | CS, 56pF, 125V, K |
| ⚠ C801 | 22487221 | EL, 220mfd, 35V |
| C802 | 22486470 | EL, 47mfd, 25V |
| C803 | 22488470 | EL, 47mfd, 50V |
| C804 | 22487101 | EL, 100mfd, 35V |
| C805 | 22488479 | EL, 4.7mfd, 50V |
| C806 | 22485330 | EL, 33mfd, 16V |
| C807 | 22488478 | EL, 0.47mfd, 50V |
| C808, 809 | 22488479 | EL, 4.7mfd, 50V |
| C810, 811 | 22370181 | MPF, 0.01mfd, 630V, K |
| C812, 813 | 22486470 | EL, 47mfd, 25V |
| ⚠ C901, 902 903, 904 905, 906 907, 908 | 22380226 | CS, 4700pF, 400V, K |
| ⚠ C909, 910 | 22440521 | EL, 1000mfd, 100V |
| ⚠ C911, 912 | 22440478 | EL, 560mfd, 100V |
| ⚠ C913, 914 | 22440521 | EL, 1000mfd, 100V |
| ⚠ C915, 916 | 22440478 | EL, 560mfd, 100V |
| ⚠ C917, 918 919, 920 | 22370306 | MPF, 0.82mfd, 100V, K |
| C921, 922 923, 924 | 22370313 | MPF, 0.1mfd, 160V, K |
| C925, 926 927, 928 | 22440411 | EL, 47mfd, 50V |
| C929, 930 931, 932 | 22380247 | CS, 2200pF, 125V, K |
| C933, 934 935, 936 | 22370313 | MPF, 0.1mfd, 160V, K |
| C937, 938 939, 940 | 22380246 | CS, 1800pF, 125V, K |
| C941, 942 943, 944 | 22370311 | MPF, 2.2mfd, 100V, K |
| C945, 946 947, 948 | 22440479 | EL, 22mfd, 100V |

| Symbol No. | Part No. | Description |
|---|---|---|
| C949, 950 951, 952 | 22380229 | CS, 10000pF, 125V, K |
| C953, 954 955, 956 957, 958 959, 960 | 22440520 | EL, 820mfd, 80V |
| ⚠ C961, 962 963, 964 | 22440525 | EL, 18000mfd, 80V |
| ⚠ C965, 966 967, 968 | 22370306 | MPF, 0.82mfd, 100V, K |
| C969, 970 971, 972 973, 974 975, 976 | 22380237 | CS, 4700pF, 400V, K |
| C977, 978 979, 980 | 22380254 | CS, 82000pF, 125V, K |
| C981, 982 983, 984 | 22380243 | CS, 270pF, 125V, K |
| C985, 986 987, 988 | 22380262 | CS, 40000pF, 125V, K |
| C989, 990 991, 992 | 22380229 | CS, 10000pF, 125V, K |
| ⚠ C993 | 22340150 | CD, 4700pF, 400V, M |
| C995, 996 997, 998 | 22380251 | CS, 5600pF, 125V, K |

**RESISTORS**

All resistors are ½W, ±5% Carbon Film unless otherwise noted. 1K ohm = 1000 ohm, 1M ohm = 1000000 ohm G = ±2%

| | | |
|---|---|---|
| R601, 602 | 22550390 | 100K ohm |
| R603, 604 | 22550356 | 150 ohm |
| R605, 606 607, 608 609, 610 611, 612 | 22550366 | 1K ohm |
| R613, 614 | 22540120 | 10K ohm |
| R615, 616 | 22550364 | 680 ohm |
| R617, 618 | 22658256 | 4.7K ohm, Semi-fixed Variable |
| R619, 620 | 22550373 | 3.9K ohm |
| R621, 622 | 22540119 | 8.2K ohm |
| R623, 624 | 22550377 | 8.2K ohm |
| R625, 626 627, 628 | 22550369 | 1.8K ohm |
| R629, 630 631, 632 | 22540112 | 1.8K ohm |
| R633, 634 635, 636 | 22550394 | 220K ohm |
| R637, 638 639, 640 | 22550385 | 39K ohm |
| R641, 642 | 22540565 | 560 ohm, G |

| Symbol No. | Part No. | Description |
|---|---|---|
| R643, 644 | 22540566 | 1.2K ohm, G |
| R645, 646 | 22550410 | 33K ohm, G |
| 647, 648 | | |
| 649, 650 | | |
| R651, 652 | 22550360 | 330 ohm |
| 653, 654 | | |
| R655, 656 | 22550361 | 390 ohm |
| 657, 658 | | |
| R659, 660 | 22550366 | 1K ohm |
| R661, 662 | 22540109 | 1K ohm |
| R663, 664 | 22550383 | 27K ohm |
| 665, 666 | | |
| ⚠ R667, 668 | 22540088 | 15 ohm |
| R671, 672 | 22550390 | 100K ohm |
| R673, 674 | 22550356 | 150 ohm |
| R675, 676 | 22540638 | 910 ohm |
| R677, 678 | 22658643 | 470 ohm, Semi-fixed Variable |
| R679, 680 | 22550359 | 270 ohm |
| R681, 682 | 22550356 | 150 ohm |
| R683, 684 | 22658643 | 470 ohm, Semi-fixed Variable |
| R685, 686 | 22550356 | 150 ohm |
| R687, 688 | 22550374 | 4.7K ohm |
| R689, 690 | 22550366 | 1K ohm |
| 691, 692 | | |
| R693, 694 | 22550362 | 470 ohm |
| 695, 696 | | |
| R697, 698 | 22550351 | 56 ohm |
| R699, 700 | 22540095 | 56 ohm |
| R701, 702 | 22550381 | 18K ohm |
| 703, 704 | | |
| R705, 706 | 22540103 | 270 ohm |
| 707, 708 | | |
| R709, 710 | 22550351 | 56 ohm |
| 711, 712 | | |
| R713, 714 | 22550361 | 390 ohm |
| 715, 716 | | |
| 717, 718 | | |
| R725, 726 | 22540096 | 68 ohm |
| 727, 728 | | |
| R729, 730 | 22540090 | 22 ohm |
| 731, 732 | | |
| R733, 734 | 22540097 | 82 ohm |
| R735, 736 | 22540087 | 12 ohm |
| 737, 738 | | |
| 739, 740 | | |
| 741, 742 | | |
| R743, 744 | 22540084 | 6.8 ohm |
| 745, 746 | | |
| 747, 748 | | |
| 749, 750 | | |

| Symbol No. | Part No. | Description |
|---|---|---|
| R751, 752 | 22540084 | 6.8 ohm |
| 753, 754 | | |
| ⚠ R755, 756 | 22500308 | 0.22 ohm, 3.15W, Wire Wound |
| 757, 758 | | |
| 759, 760 | | |
| 761, 762 | | |
| 763, 764 | | |
| 765, 766 | | |
| R773, 774 | 22540086 | 10 ohm |
| 775, 776 | | |
| R777, 778 | 22540256 | 10 ohm, 2W |
| 779, 780 | | |
| R781, 782 | 22540257 | 22 ohm, 2W |
| 783, 784 | | |
| R793, 794 | 22540141 | 820K ohm |
| R795, 796 | 22550377 | 8.2K ohm |
| R801 | 22555473 | 47K ohm, ¼W |
| R802 | 22550355 | 120 ohm |
| R803 | 22545272 | 2.7K ohm, ¼W |
| R804 | 22545473 | 47K ohm, ¼W |
| R805, 806 | 22545393 | 39K ohm, ¼W |
| R807 | 22545823 | 82K ohm, ¼W |
| ⚠ R808 | 22500271 | 1 ohm, Fusible, ¼W |
| R809 | 22545273 | 27K ohm, ¼W |
| R810 | 22545682 | 6.8K ohm, ¼W |
| R811 | 22545224 | 220K ohm, ¼W |
| R812 | 22545393 | 39K ohm, ¼W |
| R813 | 22545473 | 47K ohm, ¼W |
| R814 | 22545154 | 150K ohm, ¼W |
| R815 | 22545103 | 10K ohm, ¼W |
| R816 | 22545333 | 33K ohm, ¼W |
| R817 | 22545563 | 56K ohm, ¼W |
| R818 | 22545222 | 2.2K ohm, ¼W |
| R819 | 22545473 | 47K ohm, ¼W |
| R820 | 22540106 | 560 ohm |
| R821, 822 | 22550382 | 22K ohm |
| R823, 824 | 22550370 | 2.2K ohm |
| R825, 826 | 22550377 | 8.2K ohm |
| R827, 828 | 22540129 | 82K ohm |
| R829, 830 | 22545683 | 68K ohm, ¼W |
| R831 | 22550379 | 12K ohm |
| R862 | 22550374 | 4.7K ohm |
| R863 | 22550362 | 470 ohm |
| R864 | 22550351 | 56 ohm |
| R865 | 22550363 | 560 ohm |
| R866 | 22550358 | 220 ohm |
| R867 | 22540106 | 560 ohm |
| ⚠ R868 | 22500271 | 1 ohm, ¼W, Fusible |
| R869 | 22550367 | 1.2K ohm |

| Symbol No. | Part No. | Description |
|---|---|---|
| R901, 902 | 22550366 | 1K ohm |
| 903, 904 | | |
| 905, 906 | | |
| 907, 908 | | |
| R909, 910 | 22550358 | 220 ohm |
| 911, 912 | | |
| R913, 914 | 22550370 | 2.2K ohm |
| 915, 916 | | |
| R917, 918 | 22550386 | 47K ohm |
| 919, 920 | | |
| R921, 922 | 22550366 | 1K ohm |
| 923, 924 | | |
| R925, 926 | 22550378 | 10K ohm |
| 927, 928 | | |
| R929, 930 | 22550370 | 2.2K ohm |
| 931, 932 | | |
| R933, 935 | 22550391 | 120K ohm |
| R934, 936 | 22540131 | 120K ohm |
| R937, 938 | 22550368 | 1.5K ohm |
| 939, 940 | | |
| R941, 942 | 22550385 | 39K ohm |
| 943, 944 | | |

| Symbol No. | Part No. | Description |
|---|---|---|
| R945, 946 | 22550374 | 4.7K ohm |
| 947, 948 | | |
| R949, 950 | 22658281 | 22K ohm, Semi-fixed Variable |
| 951, 952 | | |
| R953, 954 | 22550379 | 12K ohm |
| 955, 956 | | |
| ⚠ R969, 970 | 22500328 | 22 ohm, 16W, Wire Wound |
| ⚠ R975, 976 | 22540567 | 8.2K ohm, 2W |
| ⚠ 977, 978 | | |
| R991, 992 | A8502200 | Termister, D22A |
| 993, 994 | | |

| ACCESSORIES | | |
|---|---|---|
| AC01 | 22903356 | Owner's Manual |

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